

What is claimed is:

1. A system for evaluating engine cylinder contribution comprising:
  - 2 a displacement measurement device configured to detect engine block movement relative to a stationary structure; and
  - 4 a signal analyzer coupled to the displacement measurement device and configured to evaluate the engine block movement.
- 1 2. The system of claim 1, wherein the displacement measurement device comprises a potentiometer having a shaft with a first end and a second end, wherein the first end is attached to the engine block and the second end is attached to the stationary structure.
- 1 3. The system of claim 1, wherein the engine block is mounted to the stationary structure.
- 1 4. The system of claim 1, wherein the displacement measurement device comprises a piezo cable having a first end and a second end, wherein the first end is attached to the engine block and the second end is coupled to an input port of the signal analyzer.
- 1 5. The system of claim 1, wherein the displacement measurement device comprises a cable, wherein the cable has a resistance that is proportional to strain.
- 1 6. The system of claim 1, wherein the displacement measurement device comprises a laser device.
- 1 7. The system of claim 1, wherein the displacement measurement device comprises a machine vision device.
- 1 8. The system of claim 1, wherein the displacement measurement device comprises at least one of a vibration sensing device and a sound sensing device.
- 1 9. The system of claim 1, further comprising:

2           a signal cable configured to couple the displacement measurement device and the  
3           signal analyzer, the signal cable for providing a displacement signal to the  
4           signal analyzer.

1       10.   The system of claim 9, wherein the signal analyzer further comprises:  
2           an input port configured to receive the displacement signal; and  
3           a processor coupled to the input port and configured to examine a voltage change  
4           on the displacement signal.

1       11.   The system of claim 1, wherein the signal analyzer further comprises:  
2           a connection network configured to send and to receive data;  
3           a communications interface coupled to the connection network and configured to  
4           interface the signal analyzer to the displacement measuring device;  
5           a processor coupled to the connection network and configured to receive a  
6           displacement signal corresponding to the engine block movement; and  
7           a memory coupled to the connection network and configured to store the  
8           displacement signal.

1       12.   The system of claim 11, further comprising:  
2           a display screen coupled to the connection network and configured to display the  
3           displacement signal.

1       13.   The system of claim 11, wherein the processor is further configured to compute  
2           cylinder contribution from the displacement signal.

1       14.   The system of claim 1, further comprising:  
2           a cylinder clip coupled to a first ignition wire and configured to provide a trigger  
3           signal for the signal analyzer.

1       15.     The system of claim 14, wherein the first ignition wire corresponds to a first fired  
2                   cylinder in a firing order for the engine.

1       16.     The system of claim 1, further comprising:  
2                   a distributor clip coupled to an ignition coil and configured to sample the ignition  
3                   coil voltage.

1       17.     A method for measuring cylinder contribution for an engine having a firing order,  
2                   the method comprising the steps of:  
3                   implementing a displacement measuring device for detecting engine block  
4                   movement relative to a stationary structure;  
5                   correlating the engine block movement to the firing order; and  
6                   evaluating, for at least one engine cylinder, the engine block movement.

1       18.     The method of claim 17, further comprising:  
2                   attaching a first end of the displacement measuring device to the engine block.

1       19.     The method of claim 18, further comprising:  
2                   attaching a second end of the displacement measuring device to the stationary  
3                   structure.

1       20.     The method of claim 18, further comprising:  
2                   attaching a second end of the displacement measuring device to a signal analyzer.

1       21.     The method of claim 17, wherein the engine block is mounted to the stationary  
2                   structure.

1       22.     The method of claim 17, further comprising:  
2                   displaying at least one of the cylinder contribution and the engine block  
3                   movement for at least one engine cylinder.

1       23. The method of claim 17, wherein the correlating step further comprises:  
2                   obtaining a trigger signal from a first cylinder; and  
3                   relating the trigger signal to the firing order of the engine.

1       24. The method of claim 23, wherein the relating step further comprises:  
2                   adjusting the relationship between the observed engine block movement and the  
3                   trigger signal according to an engine parameter.

1       25. The method of claim 17, wherein the evaluating step further comprises:  
2                   determining a cylinder contribution from the engine block movement.

1       26. The method of claim 25, wherein the determining step includes computing a  
2                   derivative of the engine block movement.

1       27. A system for measuring cylinder contribution for an engine, the system  
2                   comprising:

3                   means for monitoring engine block movement relative to a fixed position;  
4                   means for correlating the engine block movement to cylinder firing order; and  
5                   means responsive to the monitoring and the correlating means for evaluating, for  
6                   at least one engine cylinder, engine block movement.

1       28. The system of claim 27, further comprising:  
2                   means responsive to the correlating means for determining cylinder contribution.